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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/862,948	05/22/2001	David H. Levy	13159-002001	9745
26161	7590	09/20/2006	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			SINGH, RAMNANDAN P	
			ART UNIT	PAPER NUMBER
			2614	

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/862,948

Applicant(s)

LEVY, DAVID H.

Examiner

Ramnandan Singh

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 21-29, 34-39, 55-74, 76-84 and 91-94 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34-39, 71-74 and 76-79 is/are allowed.
- 6) ☒ Claim(s) 21-29, 55-68, 80-84, 91-94 is/are rejected.
- 7) ☒ Claim(s) 69 and 70 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed on Jun. 30, 2006 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 55 is rejected under 35 U.S.C. 102(e) as being anticipated by Krishnan [US 6,377,685 B1].

Regarding claim 55, Krishnan teaches a keypad shown in Fig. 1, comprising:

IACK (i.e. combination of primary and secondary keys) keypad comprising a substrate carrying an array of sense elements arranged to change state in response to keypad operation [Figs. 6A-6B; col. 7, lines 11-34; col. 8, line 34 to col. 9, line 12; col. 19, lines 6-39; col. 25, lines 23-30];

a flexible cover disposed above the substrate and having an exposed surface defining an array of independent key regions, with combination key regions defined in

interstices between adjacent independent key regions [Figs. 7-9; col. 19, line 7 to col. 20, line 16; col. 20, lines 48-65; col. 9, lines 41-58]; and

an array of discrete snap elements extending between the cover and the substrate and spacing the cover from the substrate, the snap elements each located between two adjacent independent key regions and adapted to resiliently collapse as a non-linear response to local pressure against the exposed cover surface to provide tactile feedback in response to pressure against both elevated and non-elevated key regions [col. 14, lines 15-44; col. 17, line 55 to col. 18, line 59; col. 7, lines 35-55; col. 11, lines 14-45; col. 15, lines 30-52].

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 21-22, 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krishnan [US 6,377,685 B1] in view of Fuhrmann et al [US 7,092,520 B2].

Regarding claim 21, Krishnan teaches a touch-sensitive input device shown in Fig. 1, comprising:

an exposed, continuous surface defining a planar area [col. 25, lines 23-30] ;  
and

a grid of sense elements coextensive with the area of the exposed surface and responsive to engagement of the exposed surface by an operator to establish a position

Art Unit: 2614

of the engagement on the exposed surface [Fig1; col. 14, lines 15-44; col. 16, lines 33-62; col. 17, line 55 to col. 18, line 59; col. 21, line 46 to col. 22, line 26; col. 8, line 34-65; col. 11, lines 14-45; col. 12, lines 8-25]; wherein the exposed surface varies in elevation across its planar area to form a series of tactile features [col. 6, line 53 to col. 7, line 11].

Krishnan does not teach expressly the input device, wherein the keypad membrane is fixed by adhesive to the circuit board.

Fuhrmann et al teach an input device , wherein the exposed , continuous surface is permanently affixed to the grid of sense elements to form an integrated assembly [ col. 5, lines 15-23].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Fuhrmann et al with Krishnan so that the touch sensitive keypad membrane can act as key switches [Fuhrmann et al; col. 5, lines 18-21].

Regarding claim 22, Krishnan further teaches the input device, wherein the tactile features comprise elevated nubs (i.e. domes or convex shaped button profile) [col. 14, lines 15-29].

Regarding claim 24, Krishnan further teaches the input device, the input device, wherein the surface carries legends associated with the tactile features (i.e. shapes) [col. 14, lines 21-40].

Regarding claim 25, Krishnan further teaches the input device, wherein the tactile features define distinct regions of the surface corresponding with associated alphanumeric characters [col. 14, lines 45-55; col. 1, lines 19-27; col. 25, lines 46-50; col. 27, lines 18-22].

Regarding claim 26, Krishnan further teaches the input device configured to output a sequence of alphanumeric characters as corresponding tactile features of the surface are engaged sequentially [col. 25, lines 46-50; col. 27, lines 18-22].

Regarding claim 27, Krishnan further teaches the input device comprising an IACK (i.e. primary and secondary keys) keypad [Fig. 2; col. 14, lines 55; col. 16, line 33 to col. 17, line 40].

Regarding claims 28-29, the limitations are shown above.

Regarding claim 23, since the combination of Krishnan and Fuhrmann et al

teaches the input device having elevated nubs (i.e. domes or convex shaped button profile) ) [Fig. 2; col. 14, lines 15-29] and a profile for finger contact [col. 20, lines 29-36; col. 22, lines 38-52], it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a profile for the elevated nubs for the input device in order to provide more finger contact subject to circuit, system and design constraints.

6. Claims 56-68 and 91-92 rejected under 35 U.S.C. 103(a) as being unpatentable over Krishnan as applied to claim 55 above.

Regarding claims 56 and 57, although Krishnan teaches a resilient, collapsible, convex "snap dome" [Figs. 1-3; col. 14, lines 15-44; col. 16, lines 33-62; col. 17, line 55 to col. 18, line 59], it would have been obvious to one of ordinary skill in the art at the time the invention was made to locate snap elements under or adjacent elevated (i.e. raised) key regions and non-elevated key regions in order to accommodate tactile feedback of the keypad operation subject to circuit, system and design constraints.

Claims 58, 59-68, 91-92 are essentially similar to claims 56 and 57, and are rejected for the reasons stated above.

7. Claims 80-84 and 93-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over [US 6,377,685 B1] in view of Thornton et al [US 5,940,015].

Regarding claim 80, Krishnan teaches an IACK keypad (i.e. combination of primary and secondary keys) comprising:

a substantially planar substrate carrying an array of sense elements arranged to change state in response to keypad operation [col. 25, lines 23-30]; and

a flexible cover disposed above the substrate and having an exposed surface defining an array of independent key regions arranged in rows and columns, with combination key regions between adjacent independent key regions, and a back surface facing the substrate and held away from the substrate by collapsible snap elements [Figs. 1-2, 7-9; col. 14, lines 15-44; col. 16, lines 33-62; col. 19, line 7 to col. 20, line 16; col. 20, lines 48-65; col. 9, lines 41-58].

Krishnan does not teach expressly using conductive contact pills underneath each key.

Thornton et al teach a multi-purpose keypad (10) shown in Fig. 2, wherein conductive contact pills underneath each key are used [col. 2, lines 37-49].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Thornton et al with Krishnan in order to impact conductive pad on the circuit board so that a multi-purpose keypad can maintain required tolerance [Thornton et al; col. 2, lines 48-49].



Regarding claim 81, since Krishnan teaches a mechanical cluster key arrangement having different types of key regions [col. 8, lines 34-65], it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the arms of the conductive pills having sloping outer regions in order to provide required tolerance for the multi-purpose keypad operation subject to circuit, system and design constraints.

Claims 82-84, 93-94 are essentially similar to claim 81, and are rejected for the reasons stated above.

***Allowable Subject Matter***

8. Claims 34-39, 71-74 and 76-79 are allowable.

9. The following is a statement of reasons for the indication of allowable subject matter:

The reasons for the indicated allowability of claims 76-79 are given in the previous Office action.

Independent claim 34 recites an electronic device and the limitation: a capacitive grid formed from a first array of conductive trace elements carried by a substrate and a second array of conductive trace elements carried by a flexible cover disposed above

the substrate. Applicant's argument is persuasive. The prior art of record does not teach this limitation.

Independent claim 71 recites a keypad and the limitation: the snap elements are arranged to provide a substantially equal tactile feedback in response to pressure against both elevated and non-elevated key regions. The prior art of record does not teach this limitation.

New search updates revealed no other prior art which teaches the limitations in the context of the claims. Therefore, claims 34-39, 71-74 and 76-79 are indicated allowable.

10. Claims 69-70 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 69 recites the limitation: the snap elements are arranged to provide a substantially equal tactile feedback in response to activating both elevated key regions and non-elevated key regions. The prior art of record does not teach this limitation.

Claim 70 is essentially similar to claim 69.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (571) 272-7529. The examiner can normally be reached on M-TH (8:00-5:30).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on (571) 272-7547. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2614

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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